

plants of a very different region. As the ancient river system gradually became obliterated owing to the elevation of the land to the south and west, the species composing the lowland forests would one by one become extinct and give place to highland or xerophytic species. Through the vicissitudes of this changing order a form of *Crataegus viridis* was in some manner able to maintain itself, as is testified by its abundance at the present time on the limestone hills of southwest Missouri and the region to the southwestward.

Our present knowledge regarding the origin of species is, of course, not sufficient to enable us to do more than conjecture as to how this came about. Possibly a fortuitous variety or type happened to be developed in this region that was better adapted to the new conditions and was thus able to withstand the increasing dryness, so that, while the species became for the most part extinct in the upper part of the ancient river course, this particular stock was entirely isolated from the parent colony and became the progenitor of the forms of *Crataegus viridis* now found occupying the regions of comparatively high altitude in the southwest, comprising the Western Ozark Colony.

If I have not added any new species to the genus *Crataegus* in this paper, I have at least shown that the *Virides* may have *not* come up the Mississippi Valley, as has generally been supposed, but have probably drifted *down* this Valley from the great Upper Mississippi Colony at Hannibal, Missouri and Quincy, Illinois.

COURTNEY, MISSOURI.

## VIOLA RENIFOLIA AND V. BRAINERDII.

M. L. FERNALD.

BOTANISTS who have collected extensively in the Northern States and Canada are familiar with the fact that *Viola renifolia* often appears in two quite different forms: the true *V. renifolia* as described by Gray, with both sides of the leaves "conspicuously beset with pale, soft and tender, lax hairs";<sup>1</sup> and another extreme with the upper leaf-surfaces quite glabrous from the first or in anthesis with

<sup>1</sup> Gray, Proc. Am. Acad., viii. 288 (1870).

only a very few scattered and quickly deciduous hairs. This latter plant, with the upper leaf-surfaces glabrous or quickly glabrate, was separated by Greene in 1902 as *V. Brainerdii*, with the statement that it is "certainly a far more common plant in northern New England and Canada than the kindred species [*V. renifolia*],"<sup>1</sup> and that it has a more upland habitat. But, although the cautious and very accurate student for whom *Viola Brainerdii* was named has not recognized it as a species, he has recently expressed his understanding of the question as follows:

"The type of *VIOLA RENIFOLIA* Gray is markedly pubescent throughout; but the more common form has at least the upper leaf surface glabrous, and has been published as a species, *V. Brainerdii*, by Professor Greene. But the difference between the two plants, though perhaps worth naming, is not specific, according to my conception of species."<sup>2</sup>

This commoner extreme of *Viola renifolia*, with the leaves glabrous above, though connected with the pubescent extreme by some transitions, is apparently a positive geographic variety and as such it should be separated. That it is, as already stated by Greene and by Brainerd, the commoner plant of the two is shown by the fact that of the 97 specimens of the species in the Gray Herbarium and the herbarium of the New England Botanical Club only 22 are of the typical copiously pubescent *V. renifolia*, while 63 are very good *V. Brainerdii* and 12 represent both extremes under the same label. But, although in northern New England and New York the two are thus sometimes found together and by some collectors have been taken to be trivial variants of the same plant, it is significant that no typical *V. renifolia* seems to have been collected northeast of New England, while in the Maritime Provinces, eastern Quebec, western Newfoundland and southern Labrador the essentially glabrous *V. Brainerdii* with bright green leaves is a common plant. Its more northern tendency is also indicated by the fact that north of the Straits of Belle Isle it is abundant on dry exposed crests where it is associated with many arctic-alpine plants such as *Poa alpina* L., *Salix vestita* Pursh, *Cerastium alpinum* L., and *Saxifraga caespitosa* L.; and in the mountains of the Gaspé Peninsula it ascends to an altitude of 1100 meters, where it is found on dry limestone crests with the plants just

<sup>1</sup> Greene, *Pittonia*, v. 89 (1902).

<sup>2</sup> Brainerd, *Bull. Torr. Bot. Cl.* xxxviii. 8 (1911).

enumerated or with *Carex rupestris* All., *Saxifraga nivalis* L., *Dryas integrifolia* Vahl, *Pedicularis flammea* L., *Campanula uniflora* L., and other arctic-alpine types. In the mountains of Colorado also this glabrous plant ascends to high altitudes, reaching 2500 m., and thence it extends northward to northern British Columbia. As a geographic variety it is well marked and it should be called *VIOLA RENIFOLIA* Gray, var. **Brainerdii** (Greene) n. comb.

GRAY HERBARIUM.

## SOME LICHENS FROM NANTUCKET ISLAND, MASSACHUSETTS.

R. HEBER HOWE, JR.

MR. EUGENE P. BICKNELL on a collecting trip to the islands of Nantucket and Tuckernuck, Massachusetts, last June (1911), was kind enough at my request to gather for me a considerable number of lichens. Though Mr. Bicknell had never collected lichens before, the collection he made contains beside the more common species a number of lichens decidedly worth recording.

It is not improbable that some lichenist in the past has collected at Nantucket, but beside a few specimens in my own herbarium collected by non-botanical friends, and a plant or two found in the Alexander W. Wheelock herbarium, I have never seen any specimens from these islands in the large museum herbaria I have from time to time examined. Dr. Riddle writes me, however, that he has noted Nantucket material in various herbaria. It was nevertheless on account of its scarcity that I ventured to ask Mr. Bicknell to gather what specimens he could for me,— and to him I am gratefully indebted.

The lichen flora as exhibited by this collection shows an interesting mixture of littoral and Austral species whose presence it is not difficult to explain by the climatic conditions governing the islands. A few curious northern species are noted.

The plants listed here are now to be found in the author's herbarium; duplicates of a few were sent to Dr. L. W. Riddle and Dr. Ludwig Scriba for their collaborative opinions.